

## The Moderating Role of Liquidity on the Relationship Between Rural Banks' Human Capital Quality and Credit Risk

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### ABSTRACT

This study examines the relationship between human capital quality and liquidity on rural bank credit risk. Human capital shows the ability of innovation, productivity, and creativity of organizational members. Therefore, human capital is related to the professional competence of organizational members. On the other hand, the OJK regulations regarding the provision of credit by rural banks state that rural bank employees must use their professionalism adequately in credit assessments. However, previous research has not discussed the role of human capital quality and rural bank liquidity level on credit risk because the research focuses on risk determinants on the macro side and internal mechanisms, such as governance. This study uses rural bank data in DIY and Central Java from 2016 to 2019. The data collected from the 433 research samples were processed and analyzed by multiple-steps regression with a significance level of 5%. The hypothesis testing results show that the Indonesian Rural Banks' liquidity moderates the human capital quality effects on credit risk. This research is expected to contribute to the theory of human capital, the practice of lending policies in rural banks, and the policies of rural bank governance.

Keywords: Rural bank, credit risk, human capital, liquidity, intellectual capital.

### 1. INTRODUCTION

As Law No.7/1992 concerning banking and the 2014 Financial Services Authority (OJK) regulations concerning Indonesian Rural Bank (IRB), in 2016 - OJK issued a regulation concerning the IRB business, namely a bank that does not provide services in the form of services through direct payments, insurance, or receipts of demand deposits - both with conventional activities or based on sharia principles. The regulation also states that a rural bank was established to serve small businesses and communities in rural areas.

An IRB has a legal rule and a legal entity, which can be a limited company, a regional government company, or a cooperative. Thus, the main activities of IRBs areas, in general, are collecting funds from the public (e.g., time deposits or savings), providing credit, and placing funds in other banks (e.g., Certificate of Bank Indonesia or time deposits and savings). However, IRBs are not allowed – as was the original purpose of their establishment – to accept deposits in the form of demand deposits, provide services for direct payment traffic, and provide insurance services directly. Furthermore, regarding foreign exchange business activities, the regulation states that IRBs as foreign exchange traders must meet a minimum core capital adequacy of 15 billion (Financial Services Authority, 2016). IRBs are

also not allowed to make capital investments, do business in insurance, or do business outside the legal provisions above.

In addition to those related to business provisions, the government, through the OJK, issues provisions on bank audits (Financial Services Authority, 2017b). The examination includes the provision of funds, bank operational activities, actions that may cause losses, obtaining unreasonable profits, financial difficulties that affect the bank's performance, and other indications. Furthermore, IRBs must also comply with the provisions regarding a company's governance (Financial Services Authority, 2015) and for IRBs in the form of a limited liability company also refer to the Limited Liability Company Law (P. R. Indonesia, 2007). In addition, the government stipulates separate regulations related to financial reports at IRBs, following the Micro, Small, and Medium Enterprises (MSME) provisions (Financial Services Authority, 2017a).

IRB is a financial institution expected to provide financial services to people in rural areas or MSMEs. Therefore, the Decree of the Minister of Finance No. 1064 / KMK.00 / 1988 concerning the Establishment and Business of IRBs also states that the duties of IRBs are directed at supporting the growth and modernization of the rural economy as well as reducing the practices of moneylenders. Furthermore, Bank Indonesia also issued Bank Indonesia Regulation (PBI) no. 14/22 / PBI / 2012, which requires every commercial bank to distribute credit or MSME financing in 2018 at least 20% of the total credit or financing. Therefore, with the issuance of the PBI, for IRB it is a challenge, opportunity, and potential to become a partner of a commercial bank in the program.

Expanded services are accompanied by an increase in the volume of IRB's business, causing more significant risks faced by IRBs. This research is based on the phenomenon of a continuous decline in financial performance at IRB between 2012 and 2019. Data from the Financial Services Authority (2019) shows that IRB credit risk increased from 2012, 2013, 2014, to December 2015. Credit risk also increased in 2016 and 2019, even though the government has set regulations related to credit, governance, and audits of IRB performance. Thus, this study views the importance of credit risk at the IRB.

This research is motivated by the problem of increasing credit risk in IRBs from 2012 to 2019. On the one hand, the government has monitored IRB performance; on the other hand, there are provisions on credit policies at IRBs. However, this mechanism is mechanistic because the IRB must have qualified human resources to estimate the client's ability to repay the loan. Related to the ability of human resources, this research focuses on the role of human capital quality and financial performance (liquidity) on IRB credit risk. Thus, the research questions are:

1. Does human capital quality have a negative effect on IRB credit risk?
2. Does the level of liquidity have a negative effect on IRB credit risk?
3. Does the level of liquidity strengthen the negative influence of human capital quality on IRB credit risk?

The purpose of this study is to prove that improving the human capital quality in IRB will reduce its credit risk, IRB financial performance (liquidity) will reduce its credit risk, and IRB liquidity has a reinforcing effect on the negative relationship between the quality of its human capital and credit risk. Thus, this research is expected to contribute to the theory of human capital, the practice of IRB credit policies, and the formulation of governance in IRBs.

## **2. LITERATURE REVIEW**

### *2.1. Human Capital and Performance*

This research is based on human capital theory which states that the ability, expertise, and experience of organizational members in managing organizational resources will encourage the ability to innovate and increase productivity. Organizations view human capital as a core asset, which comprises education, skills, knowledge, experience, competence, attitudes, commitment, and individual personality characteristics, which implies that human capital is critical for a business (Harjanto et al., 2022). In addition, human capital is part of intellectual capital that increases company innovation (McDowell et al., 2018). Therefore, the discussion of human capital begins with understanding intellectual capital. There are three intellectual capital components: human capital, social capital, and organizational capital.

According to McDowell et al. (2018), human capital is a resource resulting from the accumulation of knowledge either through the inflow of knowledge from individual members of the organization or sharing between members of the organization. Unfortunately, human capital cannot be stored in the organization, so at any time, human capital can leave the organization. Another problem is that there are different levels of knowledge among organizational members. Therefore, research by McDowell et al. (2018) uses the level of selection and knowledge as a measure of human capital.

Yusoff et al. (2019) research focuses on green human capital, namely organizational members with the competence, interest, and support for environmental sustainability. However, this study failed to prove the effectiveness of green human capital on the company's sustainability. Instead, these results indicate that companies that experience innovation gaps due to low investment in human resources affect less competent employees or members of the organization in their knowledge and experience of the environment.

Hatane et al. (2021) research focuses on the disclosure of human capital to market reactions as measured by Tobin's Q and market-to-book ratio. The test results of the two are inconsistent. Disclosure of human capital is a good signal for the market, so human capital has a positive effect on Tobin Q. However, this is not the case with the market-to-book ratio; disclosure of human capital reduces the market value of the company's book value.

It is different from the two studies above; research by Guthrie et al. (2012) stated that intellectual capital consists of human capital, structural capital, and relational capital. Human capital (human competencies) is knowledge inherent in individuals, structural capital is knowledge inherent in organizations and organizational systems, and relational capital is knowledge attached to the company's customers and external relations owned by the company. Therefore, Guthrie et al. (2012) stated that intellectual capital accounting (ICA) is the management of accounting and reporting technology to understand, measure, and report knowledge resources such as team member competencies, customer relationships, brands, financial relationships, and information and communication technologies.

Striukova et al. (2008) used the limitations of intellectual capital, as proposed by Guthrie et al. (2012), that intellectual capital consists of internal (structural) capital, external (relational) capital, and human (employee) capital. Related to research, human (employee) capital are employee, education and vocational qualifications, training, work-related knowledge, and innovativeness of employees/teams. Thus, research is not only limited to knowledge, but innovation, costs of training, education, and the number of employees are included in the scope of human capital. The definition of human capital in companies that provide professional services is different. Chang & Birkett (2004) emphasize human capital on the ability of innovation, productivity, and creativity of organizational members. Therefore, human capital is related to the professional competence of members of the organization. Furthermore, professional competence is divided into two, namely, individual and assignment. In other words, the attributes of each individual will interact with the characteristics of the assignment in forming professional competence. Chang & Birkett

(2004) define individual attributes as part of the competency dimensions, namely knowledge, abilities, experience, and motivation that accompany the assignment, while the characteristics of the assignment are limitations in acting professionally. If individual attributes are related to individual capabilities in carrying out assignments, then assignment characteristics are requirements that encourage individuals to use their inherent abilities – including motivation to carry out assignments professionally. Thus, it has a critical role in improving the performance and development of the rural bank industry (Harjanto, 2019).

## 2.2. *Bank Performance Measurement: Liquidity and Credit Risk*

The level of bank performance becomes very interesting to discuss because there are many determining factors, such as macro, micro, or governance. Purwono & Yasin's research (2018) states that macro factors such as inflation, gross domestic product, and the rupiah exchange rate affect bank inefficiency. The study also stated that inefficiency convergence occurred in 2008 - 2017, 2008 - 2010, 2011 - 2013, and 2014 - 2017. This indicates that macroeconomics can be one of the factors causing bank inefficiency in Indonesia. Macro factors are exciting things related to bank performance because in emerging economies such as Indonesia – inflation and interest rates affect macroeconomic conditions (Bayat et al., 2018).

If the research of Purwono & Yasin (2018) uses the Stochastic Frontier Approach (SFA) technique, the research of Omar et al. (2007) used a non-parametric approach technique with Data Envelopment Analysis (DEA) related to macro factors. This technique includes the input-output ratio in a mathematical program. The inputs used in this study are total deposits, personnel expenses, and capital, while the outputs are loans and advances, capital market investments, and money. Based on the sample from 2002 to 2004, it was revealed that 2002 was the highest efficiency performance of banks in Indonesia. However, this period's efficiency was not a determinant of growth due to technical aspects, such as information and communication technology, training, and expertise. Research also reveals that large banks are no more efficient than small banks, and size has no effect on productivity.

Irwan & Kacaribu's research (2017) uses a micro and macro approach to measuring bank performance. According to him, bank performance can be determined by macro, credit, and cyclical risks. The ability of each bank to minimize its credit risk will affect macro risk. Similarly, macro conditions will affect the credit risk of each bank. Furthermore, credit risk also affects cyclical risk, but cyclical risk has a very low effect on macro risk. The researcher provides recommendations on the importance of the bank's ability to manage cycle risk and credit risk. However, both will provide a high return or return as well.

Regarding the elements of governance, research by Shaban & James (2018) emphasizes the type of ownership of performance and risk. Researchers distinguish ownership into two: banks owned by the private sector and the government. The test results reveal that banks owned by the government (central or regional) have lower performance than those owned by the private sector (Shaban & James, 2017). Another thing is that foreign-owned banks tend to have low non-performing loans, but privately-owned banks tend to be more efficient and perform better than foreign or state-owned banks.

Research by Mukhtaruddin et al. (2019) also uses the influence of governance on firm value. However, the research does not explicitly mention the elements in the governance used. Nevertheless, the test results reveal that governance does not affect firm value because investors do not respond to governance that is not able to increase company profits (Mukhtaruddin et al., 2019). If the research above emphasizes commercial banks, the research by Gupta & Mirchandani (2020) focuses on microfinance. This study also details

governance in the form of ownership structure, board of directors, and the number of independent directors associated with social performance, namely customer outreach (CO), percentage of female clients (FC), average loan size (ALS), cost per borrower (CB), and operational self-sufficiency (OSS). The test results reveal that banks – microfinance – with socially-oriented governance have more customers and female clients and are more efficient.

Mersland & Øystein's (2009) research also uses microfinance samples to measure performance and outreach to poor clients. However, the governance in this research is focused on the board of directors' characteristics, ownership type, consumer-company relationship, competition, and regulation. The test results reveal that the performance of microfinance is higher if local directors manage the entity compared to international directors, internal board auditors, and female CEOs (Mersland & Øystein, 2009). This study is controversial with the results of research by Tinkler et al. (2015) that women with the same technical ability as their male colleagues will be judged equally by the labour market. However, Tinkler et al. (2015) research revealed that the labour market would choose male leaders over women, both having the same advantages.

### *2.3. Research Hypothesis*

Credit risk in banks is generally measured by the Non-Performing Loan Ratio (NPL), namely NPL to loans. Another credit risk, for example, bonds are measured by a bond rating (Ham & Koharki, 2016). According to Jiménez (2005), the determinants of credit risk can be in the form of macro and micro problems, for example, economic conditions, gross domestic product, interest rates, inflation, guarantees, and entity risk characteristics. Other studies use governance as a determinant of credit risk (Ham & Koharki, 2016). Governance factors are accompanied by company-specific characteristics, such as size, fundamental factors - ROA, leverage, PPE -, and stock returns. Thus, the determinants of credit risk are very broad and depend on the characteristics of the industry.

Referring to the standard guidelines issued by Bank Indonesia (2012), lending by banks – particularly IRBs – must adhere to the precautionary principle. The ability of IRB employees is needed to assess collateral, business risk, and credit quality. This provision also states the importance of the professionalism of credit employees and management related to credit provision. Thus, the human element becomes vital in terms of credit risk. The ability of employees to understand macro conditions, clients, and fundamental internal factors is the main capital for reducing credit risk in banks (IRB).

Previous empirical evidence revealed that the disclosure of human capital is a good signal for the market, so human capital has a positive effect on Tobin Q (Hatane et al., 2021). Chang & Birkett (2004) emphasize the ability of innovation, productivity, and creativity of organizational members. Therefore, human capital is related to the professional competence of organizational members.

Based on the results of this study, this study concludes that the ability of individual organizations to predict the level of credit collection affects reducing credit risk. Therefore, the research hypothesis is as follows:

#### **H1: The human capital quality has a negative effect on credit risk**

Bank liquidity is the bank's ability to manage financial solvency or solvency (Brůna & Blahová, 2016). According to Brůna & Blahová (2016), that pressure on liquidity can be in the form of systematic economic and company-specific conditions. However, the consequences of credit risk are also essential to observe. Scip et al. (2019) research revealed that liquidity affects the capital or funds investors invest. The higher liquidity encourages investors to invest intensively. Referring to the research of Ham & Koharki (2016) that

specific company characteristics, for example, size and fundamental factors (ROA, leverage, PPE) affect credit risk, this study also believes that liquidity has a negative effect on credit risk. Thus, this study establishes hypotheses related to liquidity as follows:

**H2a: Liquidity level has a negative effect on credit risk**

If the human capital quality at the IRB has a negative effect on credit risk at the IRB, then it shows the ability or competence of credit employees to the possibility of the IRB experiencing credit risk. Referring to previous research that the company's fundamental factors are the determinants of credit risk, this study suspects that liquidity affects the relationship between human capital quality and credit risk. The company's financial capability will affect the amount of credit given to its clients. However, the policy of credit officers in determining credit risk is also influenced by the company's financial condition. On the one hand, the company must have qualified employees to provide credit.

On the other hand, however, the company must also have a strong financial foundation in providing credit. Thus, the level of liquidity strengthens the negative relationship between human capital quality and credit risk. Therefore, the research hypothesis is:

**H2b: Liquidity moderates the negative influence of human capital quality on credit risk**

### 3. RESEARCH METHODS

#### 3.1. Data and Sample

The research used a purposive sampling method within the population of rural banks in the province of Central Java and the Special Region of Yogyakarta. This method aims to meet the specific criteria in accordance with the problems, namely the implementation of governance and human resource competencies that are inadequate at IRBs.

The use of the sample using IRB in Central Java Province and Yogyakarta Special Region Province because the financial performance of rural credit banks (IRB) between 2016 and 2019 in these two provinces is quite good compared to national achievements. The average number of non-performing loans (NPL) is only 5.8%, while the national average is 6.15%. In addition, there are no IRBs in Central Java and the Special Region of Yogyakarta under special supervision by the authorities.

However, in 2017 of the total IRBs in Central Java Province and the Special Region of Yogyakarta Province, there were around 15 IRBs or 5 percent in problematic conditions. Therefore, from the condition of IRB in Central Java Province and Yogyakarta Special Region, it is hoped that purposive sampling from the two provinces represents the condition of the population. Thus, the criteria used in this purposive sampling are:

1. IRB with core capital of IDR 50 billion and below
2. IRB is still operating until December 31, 2019
3. IRB publishes annual financial reports and other information in December 2016, 2017, 2018, and 2019 on the websites of Bank Indonesia (BI) and the Financial Services Authority (OJK)
4. IRB published information related to the data required in this research on the IRB website in 2016, 2017, 2018, and 2019, respectively.

#### 3.2. Research Variable

To measure IRB credit risk, the indicator used in this study is the Non-Performing Loan Ratio (NPL). This indicator is one of the most important indicators used in the literature to represent a bank's credit risk and credit quality. A lower ratio indicates better asset quality and lowers doubtful credit, therefore, lower credit risk (Ekinici & Poyraz, 2019).

More specifically, the use of NPL as the dependent variable in this study is Net NPL which is calculated using the formula:

$$\text{NPL} = (\text{Loan Loss} / \text{Total Loans Disbursed}) \times 100\% \quad (1)$$

The independent variable of this research is human capital. One of the characteristics of human capital includes learning and education (Sharabati, Jawad, & Bontis, 2010), so in this study, the human capital indicator is indicated by the suitability of the education of the directors and the board of commissioners, including independent commissioners with undergraduate education majoring in economics or business in their respective fields each Rural Bank (Harjanto & Rahmawati, 2018).

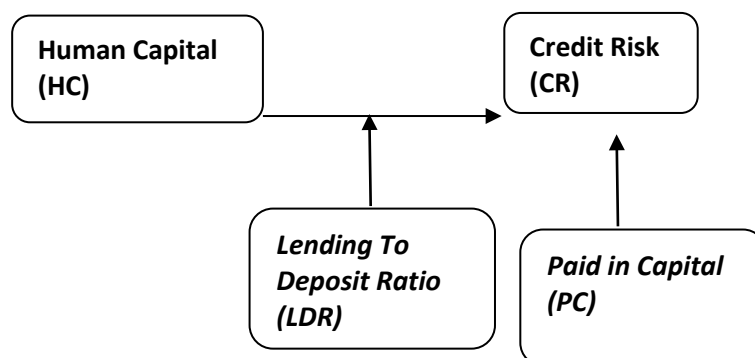
This is indicated by 1 if the education level of the board member is below S1 (Bachelor); 2 if he/she has an undergraduate education level from a non-economic or business major; and 3 if he/she has a bachelor's degree in economics or business (Harjanto & Rahmawati, 2018; Harjanto et al., 2022). This indicator was adapted according to IRB conditions from research using educational backgrounds that contained information about the suitability of the degree held in economics and business, be it bachelor's, master's, or doctorate (King, Srivastav, & Williams, 2016). This study uses liquidity as a moderating variable measured by the Loan to Deposit Ratio (LDR). The LDR ratio states how far the bank's ability to repay withdrawals made by depositors. LDR is the ratio of total loans disbursed to total funds received. So, the loan-to-deposit ratio formula is:

$$\text{LDR} = (\text{Loans Granted} / \text{Total Deposits Received}) \times 100\% \quad (2)$$

This study also places the IRB's paid-in capital as the controlling variable. The use of IRB's paid-in capital as a controlling variable in this study is manifested in the Natural Logarithmic (Ln) variable Paid-up Capital of IRBs in accordance with the OJK statement (2017) that the continuous decline in the financial performance of IRBs is also caused by a lack of core capital / paid-up capital of IRBs.

### 3.2. Research Model

Based on the research variables that have been determined, the secondary data related to the research variables that have been collected will be processed and analyzed by stepwise regression with a significance level of 5%. Testing and data analysis will be carried out according to the model for the following hypotheses:



$$H1: CR = \alpha + \beta_1HC + \beta_2PC + \varepsilon$$

$$H2: CR = \alpha + \beta_1LDR + \beta_2PC + \varepsilon$$

$$H3: CR = \alpha + \beta_1HC + \beta_2LDR + \beta_3HC *LDR + \beta_4PC + \varepsilon$$

Notes:

1. Dependent Variable = CR (Credit Risk proxied using IRB Non-Performing Loan Ratio).
2. Independent Variable = HC (Human Capital IRB proxied using the Total Education Conformity Score in the Business Field of Boards).
3. Moderating Variable = LDR (Liquidity).
4. Control Variable = PC (Natural Logarithm of Paid-in Capital of IRB).

## 4. RESULTS

### 4.1. Descriptive statistics

This study uses independent variables: human capital as measured by the suitability of the education of the board members. In table 1 it is stated that the minimum score is 2 and the maximum is 18. IRB credit risk, as the dependent variable, is measured by the ratio of non-performing loans (NPL), and in table 1 the value is stated from 0.01% to 47%. This study also uses a moderating variable as measured by the loan to deposit ratio (LDR), which shows the bank's ability to repay the withdrawal of funds made by depositors. Based on table 1 that is 37% to 198%. Furthermore, this study uses IRB's paid-in capital as the controlling variable, and the value is 13% to 24% (see table 1).

Table 1. Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic
Credit Risk	433	0.01%	47.00%	5.940%	5.662%
Human capital quality	433	2	18	8.55	3.36
Loan to Deposit Ratio	433	37.21%	198.04%	96.462%	20.070%
Paid-in Capital	433	13.816	24.635	18.010	3.623

### 4.2. Hypothesis Testing

This study establishes three research hypotheses which are divided into H1: the human capital quality has a negative effect on IRB credit risk, and the second hypothesis is H2a: liquidity level has a negative effect on IRB credit risk, and H2b: liquidity moderates the negative influence of the human capital quality on IRB credit risk. The test result reveals that human capital has a significant negative effect on credit risk (see table 2). Thus, the first hypothesis is accepted as hypothesized in this study.

Table 2. Hypothesis Testing

Dependent: Credit Risk	Coefficient	t	P-Value
(Constant)		7.172	.000
Human Capital	-.366	-4.629	.000
Loan to Deposit Ratio	-.075	-5.757	.000
Human Capital * Loan to Deposit Ratio	1.663	4.246	.000
Ln. Paid-in Capital	.146	1.988	.047
Adjusted R Square	11.4%		
F	14.932		
Sig	0.000		



Furthermore, hypothesis 2 also has results in accordance with the initial hypothesis that the loan-to-deposit ratio significantly negatively affects credit risk. In hypothesis 3, this study examines the moderating loan to deposit ratio as a moderator of the relationship between human capital and credit risk. The test results reveal that the positive moderation is significant, so the loan-to-deposit ratio strengthens the negative relationship between human capital and credit risk. Thus, more professional human capital will reduce credit risk. Furthermore, the bank's ability to repay depositors' funds will reduce the bank's credit risk.

## 5. DISCUSSION

Studies on performance in the banking sector generally focus on commercial banks and use macro factors as a determinant of bank performance, such as the research of Purwono & Yasin (2018), which obtained empirical evidence about the effect of the economic or macro situation on the level of bank efficiency. Research by Omar et al. (2007) using a non-parametric approach technique with Data Envelopment Analysis (DEA) also links bank performance with macro factors. However, research by Shaban & James (2018) emphasizes the type of ownership on bank performance and risk. Research by Mukhtaruddin et al. (2019) also uses the influence of governance on firm value. The last two studies focus on the internal factors of the bank.

Gupta & Mirchandani (2020) focuses on microfinance and reveals the effects of governance on the number of consumers, female clients, and efficiency of entities. Mersland & Øystein's (2009) research also uses microfinance samples to measure performance and outreach to poor clients. However, this research does not explicitly focus on human resources, even though, according to Bank Indonesia (2012) provisions, lending by banks – especially IRBs – must refer to the precautionary principle, namely the ability of IRB employees to assess collateral, business risk, and credit quality. On the other hand, the government, through the OJK, has established a mechanism to reduce IRB credit risk through management and supervision. Thus, it is essential to explore further related to human resources or the human capital quality in IRB. This study focuses on testing human capital against credit risk with the ability to provide depositors' funds as a moderator of the relationship.

## 6. CONCLUSION

This research is based on human capital theory which states that the ability, expertise, and experience of organizational members in managing organizational resources will encourage the ability to innovate and increase productivity. It is proven by this research results that human capital quality reduce IRB credit risk through proper management and supervision performed by proper strategic human capital. Furthermore, the liquidity which is also managed and supervised by proper strategic human capital, strengthens the negative relationship between human capital and credit risk. Future research will focus more on the role of human capital, and it is explored deeply using questionnaires or interviews directly with the related respondents.

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